

Remediating Primary Education Through Gamification: Using Game based Techniques to Enhance Learning in Primary Schools

- **Chargui Bachagha^{1*}**

Abdelhamid Ibn Badis-Mostaganem (Algeria),

charguibachagha@gmail.com,

- **Badji Mokhtar²**

Univerity-Annaba (Algeria),

fatmadrid606@gmail.com

Réception : 06/03/2023 ; Acceptation : 06 /05/2026 ; Date de publication : 01/06/2026

Abstract:

This paper examines the potential of gamification to remediate to remediate primary education. The use of game-like elements and mechanics in non-game contexts is proposed here as a solution to students' disengagement and lack of motivation. This study delivers a theoretical background on the game-based approach to education and explores the challenges and potential solutions facing its implementation in primary education. The analysis is concluded with recommendations for policy and practice as well as future research trajectories.

Keywords: *gamification; remediate; primary education; theoretical background; recommendations.*

* **Chargui Bachagha**

1. INTRODUCTION

Primary education is widely acknowledged as the foundation of a successful educational experience. It is during this period that students acquire the basic skills and knowledge necessary to pursue further education and succeed in life. However, traditional teaching methods often fail to fully engage and motivate young learners, resulting in lower learning outcomes. The lack of engagement is particularly problematic given the increasingly digital and gamified environment in which students grow up. Gamification, the use of game-like elements and mechanics in non-game contexts, has been proposed as a solution to address the challenges of traditional teaching methods. The potential of gamification to enhance learning outcomes by increasing engagement, motivation, and enjoyment has been increasingly recognized by educators and researchers alike. In particular, gamification has shown promise in enhancing learning outcomes in primary education, where the foundation of knowledge and skills is laid.

In Algeria, this mechanism is still in its infancy, supposing that it saw life in the first place. A country with significant financial and logistical resources, Algeria has the potential of pioneering the use of game-based education throughout its primary schools. The post-pandemic year could have witnessed a fundamental change in traditional conception of pedagogy. With pupils of primary schools becoming used to interacting with different digital devices. Consequently, post-pandemic experimentation with next generation educational techniques could not have been timelier.

The purpose of this paper, therefore, is to examine the potential of gamification to remediate primary education and enhance learning outcomes. This study will provide a theoretical background on gamification and game-based learning, discuss successful examples of gamification in primary education, explore the challenges and potential solutions to implementing gamification in primary schools, examine the different game-based techniques that can be used to enhance learning outcomes, and evaluate the effectiveness of gamification through previous studies. Ultimately, the analysis aims at providing insights for educators, policymakers, and researchers into the potential of gamification to enhance

primary education and improve learning outcomes. By understanding the potential of gamification and the challenges associated with its implementation, stakeholders can work together to create effective gamified learning environments that engage and motivate young learners, resulting in improved learning outcomes and better educational experiences.

1.1 Literature Review and Theoretical Background

Literature on gamification and game-based learning provides a foundation for understanding the potential of gamification to remediate primary education and enhance learning outcomes. Gamification is the use of game-like elements and mechanics in non-game contexts, such as education, healthcare, and business. The goal of gamification is to increase engagement, motivation, and enjoyment by leveraging the psychological drivers of games, such as challenge, feedback, and reward.

Game-based learning, on the other hand, refers to the use of games themselves as a learning tool. In this approach, games are designed to teach specific knowledge or skills, and the learning objectives are integrated into the game mechanics. Both gamification and game-based learning have been shown to enhance learning outcomes by increasing engagement and motivation. This is particularly important in primary education, where traditional teaching methods may fail to fully engage young learners. Research on gamification and game-based learning has highlighted several key benefits. One benefit is the potential to increase student motivation and engagement. Games are inherently motivating, and the use of game-like elements in non-game contexts has been shown to increase engagement and motivation in learners.

Additionally, gamification and game-based learning can increase student autonomy and agency, as learners are given more control over their learning experiences. This can lead to greater intrinsic motivation and a deeper understanding of the material. Another benefit is the potential to increase learning outcomes. Gamification and game-based learning can provide immediate and continuous feedback to learners, which can improve learning outcomes by allowing students to correct their mistakes and adjust their approach in real-time. Games can also provide a safe and immersive environment for learners to experiment and practice new skills, leading to deeper and more meaningful learning. However, there are also potential

drawbacks to gamification and game-based learning. One concern is that the game-like elements may overshadow the learning objectives, leading to superficial learning. Additionally, the use of games may not be appropriate for all learning objectives and may not be accessible to all learners, particularly those from disadvantaged backgrounds.

The vast majority of conducted research in this area focuses on the potential of gamification on enhancing students' learning ability and inducing engagement. Recently there has been an effort to from some scholars to identify the main trend with regard to the study of gamification in learning environments. One of these initiatives was a study conducted in 2015, in which the authors analyzed 113 articles from various databases and found that the most common research focus is on the effectiveness of gamification in improving learning outcomes and engagement. The study also identified several research gaps, including the need for more longitudinal studies and the need to examine the impact of gamification on diverse populations. Overall, the authors suggest that gamification has the potential to enhance learning outcomes and engagement, but further research is needed to fully understand its impact in educational contexts (Dicheva et al., 2015).

A similar review that was conducted in 2014, attempted to throw some light on the challenges associated with gamification, such as the need for careful design and implementation. The article reviews the current state of research on gamification in education and identifies some research gaps, such as the need for more studies on the long-term effects of gamification and the impact of gamification on diverse populations. The article provides examples of successful gamification implementation in different educational settings and concludes that gamification has the potential to enhance student learning outcomes and engagement in education, but further research is needed to fully understand its impact (Polytechnic & Yun, 2014).

Although there is a plethora of perspectives on the subject among scholars, Both gamification and game-based learning, which are grounded in the principles of experiential learning and motivation theory, are the dominant approaches in the study of game-based education. Experiential

learning, proposed by Kolb (1984), posits that learning occurs through the active engagement of learners in real-life experiences. Gamification and game-based learning provide opportunities for students to engage in experiential learning by immersing them in a game-like environment that simulates real-life experiences. This approach, therefore, allows students to apply their knowledge and skills in a meaningful context, promoting deeper learning.

2. Gamification in Primary Education

Gamification is a relatively new approach to education that involves the use of game-based techniques to enhance learning. In recent years, gamification has gained popularity in primary schools due to its potential to improve student engagement and motivation. The following are some examples of successful implementation of gamification in primary schools and the impact it has had on student learning outcomes.

Classcraft is a gamification platform that has been successfully implemented in primary schools in the United States. The platform uses a role-playing game approach to learning, where students create characters and progress through various quests and challenges. The game mechanics, such as points, levels, and rewards, help to increase student motivation and engagement. The platform also promotes collaboration and teamwork, as students work together to complete quests and challenges. Studies have shown that Classcraft has a positive impact on student engagement and learning outcomes. In a study conducted by the University of Michigan, students who used Classcraft showed a 90% increase in engagement and a 63% improvement in academic performance compared to those who did not use the platform (Gutiérrez-Artacho & Del Mar Sánchez Pérez, 2020).

Another similar platform, Kahoot!, has been successfully implemented in primary schools. This attractive learning platform is a quiz-based game that allows teachers to create and share quizzes with their students. Students can compete against each other in real-time, which promotes healthy competition and increases student motivation. Kahoot! has been shown to improve student engagement and learning outcomes. A study conducted by the University of Oslo found that students who used Kahoot! had higher test scores and a more positive attitude towards learning compared to those who did not use the platform (Wang & Tahir, 2020).

While such interactive platforms may have the potential to enhance student engagement and motivation in primary education, implementing gamification strategies in the classroom does not come without challenges. Some of the hurdles that educators may face when implementing gamification in primary education include:

1. One of the primary challenges of implementing gamification in primary education is resistance to change. Some educators may be hesitant to adopt new technologies or teaching strategies, especially if they have been successful with traditional methods in the past. It may take time and effort to convince these educators of the benefits of gamification and to get them on board with implementing it in their classrooms.
2. Another challenge of implementing gamification in primary education is a lack of resources. Some schools may not have the necessary technology or funding to purchase gamification platforms or develop their own. In addition, creating effective gamification strategies can require a significant investment of time and resources from educators.
3. A key consideration when implementing gamification in primary education is how it aligns with the curriculum. It is important for gamification strategies to be integrated with the curriculum in a meaningful way that supports learning outcomes. If gamification is viewed as a separate or disconnected activity, it may not have the desired impact on student learning.
4. Gamification is supposed to be responsibly enjoyable. Some of the of gamification strategies are intended to make learning more fun and engaging, but it is important to strike a balance between fun and learning. If gamification is focused too heavily on fun and entertainment, it may not effectively support student learning

outcomes. Conversely, if gamification is too focused on academic achievement, it may not engage students or be as effective in enhancing motivation and engagement.

5. Finally, there is a concern about *accessibility* and *equity* in implementing gamification in primary education. Not all students may have access to the necessary technology or devices to participate in gamification activities. In addition, some students may be less comfortable with technology or less familiar with gaming concepts, which could put them at a disadvantage compared to their peers.

Indeed, implementing gamification in primary education can present challenges; however, these could be adequately and individually addressed provided there is a firm institutional will. For instance, with regard to reluctance to change, it is important to communicate the benefits of gamification and involve educators in the planning and implementation process. Providing professional development opportunities to help educators become more familiar with gamification strategies and their benefits can also help to overcome resistance to change. Second, to address the lack of resources, schools can explore free or low-cost gamification platforms or tools that are available online.

Alternatively, educators can develop their own gamification strategies using existing resources such as interactive whiteboards, smartphones or tablets, or even physical games and activities that support the curriculum. Third, to ensure that gamification is effectively integrated with the curriculum, it is important to plan gamification strategies in collaboration with subject matter experts. This can help to ensure that the strategies are aligned with learning objectives and support the curriculum. Fourth, to achieve a balance between fun and learning, it is important to focus on the learning outcomes that the gamification strategies are intended to support. Educators can also use data and feedback from students to fine-tune the gamification strategies and make sure they are effective in supporting learning outcomes.

Lastly, to address accessibility and equity concerns, educators can provide alternative methods of participation in gamification activities, such as allowing students to work in groups or pairs. They can also make sure that gamification strategies are accessible to all students, regardless of their level of technology access or familiarity with gaming concepts.

The sum of these solutions is far from conclusive, but at least they may bypass hesitation and deliver a kickstart to genuine experimentation in game-based education in our elementary schools. Challenges are not usually met by giving in to doubt and cynicism. Daring decisions, such as the introduction of English in primary education, is a testimony when political will becomes responsive to educational needs. We believe the same can be applied with regard to experimenting with innovative techniques, such as the one being advocated in this paper.

3. Evaluating the effectiveness of Gamification in Primary Education

As it has been introduced, one way to empirically test the effectiveness of game-based education in elementary schools is to analyze the data offered by gamification platforms such as the ones mentioned earlier. There have been a number of empirical attempts to build conclusions following similar approach. For example, recently, there was a study that analyzed the effectiveness of gamification mechanics in increasing student engagement in elementary school. It found that gamification had a positive effect on engagement, with students who received more badges from the teacher being more engaged. The intention here was to highlight the importance of aligning gamification strategies with educational purposes and the role of the teacher in stimulating student engagement, concluding that gamification can be an effective engagement strategy for teachers, providing a general view of student behavior and cognitive skills, and allowing students to be aware of their own skills for improvement (Da Rocha Seixas et al., 2016).

But the word “engagement” needs further substantiation if our analysis is to be adequate. According to Luo (2021), there are three main variations of engagement: behavioral engagement, which is “the task engagement people can observe based on users’ behaviours; affective engagement, which is “the task engagement linked to emotional reactions”;

and cognitive engagement, which is “a psychological state in which students are willing to put time and efforts to ‘truly understand a topic’ and in which students ‘persist studying over a long period of time’” (p. 899). While it is beyond the scope of this study to thoroughly analyze these investigate these contributions, it is, however, important to emphasize the role they play in streamlining gamification as a newly developed technique.

Using Classdojo as a case study, a gamification website, Aljraiwi (2019) found out that gamification of web-based learning improves academic achievement and creative thinking skills by promoting learning motivation, higher-order thinking, cooperation, communication, and problem-solving. Utilizing multi-media technology and providing feedback and instant evaluation of students' responses improves their performance. The availability of content at all times enables self-learning and revision of lessons. Using the Classdojo website for gamification makes education more fun and helps students study well. Participation in the website's activities promotes creative thinking and positive communication, cooperation, and competitiveness among participants (pp. 251-253).

This study is particularly revealing. As it was conducted in an Arab country, Saudi Arabia, this means that there is a working precedent that shares the same langue as ours, who successfully adapted gamification in their educational system. Moreover, it opens up areas of collaboration between teachers and ministries to share experiences on the application of this technique.

Such studies can be adapted in the implementation of specific national designs of game-based learning, since it is inadvisable to apply “standard” gamification design of other advanced countries to those that have not yet gathered enough feedback corpus from established experimentation (An, 2020). Therefore, it is only appropriate to adapt those experiments with extensive adjustment in order to suit the specific needs of a particular educational system. Compatibility, therefore, is the name of the game.

There has been significant research on the effectiveness of gamification in primary education; Nonetheless, there are still several areas that require further exploration. Here are some potential future research directions:

- **Long-term effects:** While there is evidence that gamification can increase student engagement and motivation in the short term, there is limited research on the long-term effects of gamification in primary education.
- **Teacher training:** Many teachers may not have the necessary training or experience to effectively implement gamification strategies in their classrooms. Future research could explore the most effective methods for training teachers on how to use gamification in primary education.
- **Impact on different subjects:** Most research on gamification in primary education has focused on math, science, and language arts. Future studies could explore the effectiveness of gamification in other subjects, such as social studies, art, and music.
- **Cultural differences:** There may be cultural differences in the effectiveness of gamification strategies in primary education. Future studies could explore how gamification strategies can be adapted to different cultural contexts to maximize their effectiveness.
- **Integration with technology:** With the increasing use of technology in primary education, future research could explore how gamification strategies can be integrated with educational technology tools to enhance student learning and engagement.
- **Impact on student well-being:** While gamification can increase student engagement and motivation, there is limited research on its impact on student well-being.

Furthermore, studies could explore the potential risks of over-gamification and the impact on student mental health and well-being. Impact on diverse student populations: Future studies could explore the

effectiveness of gamification strategies on diverse student populations, including students with disabilities, English language learners, and students from different socioeconomic backgrounds.

4. Conclusion

The implementation of gamification in primary education has shown great promise as a tool for increasing student engagement, motivation, and achievement. Through various successful examples, we have seen how gamification strategies have been adapted to different subject areas, student populations, and cultural contexts, and how they have been integrated with educational technology tools to enhance student learning.

However, the implementation of gamification in primary education also presents several challenges that need to be addressed, including teacher training, over-gamification, and cultural differences. Future research can help to further understand these challenges and explore new avenues for the integration of gamification strategies in primary education.

Despite these challenges, the potential benefits of gamification in primary education are too great to be ignored. By using game-based techniques to enhance learning, we can provide students with a more engaging and personalized educational experience, ultimately leading to improved academic performance and greater overall success. As we move towards a more technology-driven and interconnected world, the integration of gamification in primary education can help to prepare our future generations for the challenges and opportunities ahead. It is up to educators, researchers, and policymakers to work together to ensure that gamification strategies are implemented effectively and ethically, and to continue exploring new frontiers in the field of gamification in education.

Bibliography:

1. Aljraiwi, S. S. (2019). Effectiveness of Gamification of Web-Based Learning in Improving Academic Achievement and Creative Thinking among Primary School Students. *International Journal of Education and Practice*, 7(3), 242–257. <https://doi.org/10.18488/journal.61.2019.73.242.257>
2. An, Y. (2020). Designing Effective Gamified Learning Experiences. *International Journal of Technology in Education*, 3(2), 62. <https://doi.org/10.46328/ijte.v3i2.27>
3. Da Rocha Seixas, L., Gomes, A. S., & De Melo Filho, I. J. (2016). Effectiveness of gamification in the engagement of students. *Computers in Human Behavior*, 58, 48–63. <https://doi.org/10.1016/j.chb.2015.11.021>
4. Dicheva, D., Dichev, C., Agre, G., & Angelova, G. (2015). Gamification in Education: A Systematic Mapping Study. *Educational Technology & Society*, 18(3), 75–88. http://www.ifets.info/journals/18_3/6.pdf
5. Gutiérrez-Artacho, J., & Del Mar Sánchez Pérez, M. (2020). Conquering the Iron Throne: Using Classcraft to Foster Students' Motivation in the EFL Classroom. *Teaching English With Technology*, 20(4), 3–22. <http://files.eric.ed.gov/fulltext/EJ1271835.pdf>
6. Hanus, M., & Fox, J. (2015). Assessing the effects of gamification in the classroom: A longitudinal study on intrinsic motivation, social comparison, satisfaction, effort, and academic performance. *Computers & Education*, 80, 152–161. <https://doi.org/10.1016/j.compedu.2014.08.019>
7. Luo, Z. (2021). Gamification for educational purposes: What are the factors contributing to varied effectiveness? *Education and Information Technologies*, 27(1), 891–915. <https://doi.org/10.1007/s10639-021-10642-9>
8. Polytechnic, M., & Yun, H. (2014). The role of gamification in education—a literature review. *Contemporary Engineering Sciences*, 7, 1609–1616. <https://doi.org/10.12988/ces.2014.411217>
9. Wang, A. I., & Tahir, R. (2020). The effect of using Kahoot! for learning – A literature review. *Computers & Education*, 149, 103818. <https://doi.org/10.1016/j.compedu.2020.103818>